

NOTES ON THE ETHOLOGY OF *NEOSCLEROPOGON ELONGATUS*  
(DIPTERA: ASILIDAE) IN SOUTH AUSTRALIA<sup>1,2</sup>

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*Abstract.*—Notes are presented on the predatory and mating behavior of *Neoscleropogon elongatus* (Macquart) in South Australia. Prey taken by *N. elongatus* represented three orders, Diptera, Hymenoptera, and Heteroptera-Hemiptera, with Diptera and Hymenoptera accounting for 88% of the prey. Mating, without prior courtship, occurred in the tail-to-tail position, typical of *Dasyponinae*.

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The taxonomy of *Neoscleropogon elongatus* (Macquart) is somewhat confused. It was first described by Macquart in 1847 in the genus *Dasyponogon*. White (1917) regarded it as belonging to the genus *Stenopogon* and recorded it from Tasmania in January and February. Hardy (1926) illustrated the genitalia of *S. elongatus* from New South Wales specimens, but later (1930) indicated that this drawing referred to *S. fraternus* Bigot. However, in 1934, he established *S. elongatus* as a synonym of *S. fraternum* (misspelled). As a result of his visit to Australia, Hull (1962) again separated the two species and placed both in the genus *Neoscleropogon*. Therefore, if White and Hardy were correct in their identifications, *N. elongatus* has been recorded, thus far, only from Tasmania and *N. fraternus* from New South Wales.

Data included herein on the behavior of *N. elongatus* is admittedly incomplete. However, since the behavior of Australian asilids is virtually undocumented, these notes may be of some interest.

Behavioral observations were made on this species, at Sandy Creek, near Gawler, South Australia, intermittently between November 28 and Decem-

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ber 12, 1978, in a harvested oat field and the weedy area adjoining it. Salvation jane (*Echium plantagineum* L.) was common in the field of oats, while the weedy area was dominated by a wallaby grass (*Danthonia geniculata* J. M. Black), a spear grass (*Stipa semibarbata* R. Br.), *Lipidosperma viscidum* R. Br., *Neurachne alopecuroidea* R. Br., and *Baeckea behrii* (Schldl.) F. Muell. The weather was typical for a South Australian spring, with several days of rain during the period and temperatures ranging from 16° to 28°C.

Other locations in South Australia where *N. elongatus* was collected are Aldinga Beach, 22.i.79, and Ferries-McDonald Conservation Park, south of Monarto, 12.xii.78. The habitat in both locations was composed of native vegetation, e.g., Mallee scrub, and beach scrub community, respectively.

Methods used to observe *N. elongatus* were the same as those used in describing the behavior of *Neoitamus vittipes* (Macquart) (Lavigne, 1982).

#### FORAGING AND FEEDING BEHAVIOR

Asilids were active whenever it was not raining and temperatures exceeded 21°C. Orientation flights were long (3 to 7 m) undulating excursions with the asilid often zigzagging through the vegetation 15 to 46 cm above the ground. *Neoscleropogon elongatus* foraged from oat stubble and dried plant stalks at heights ranging from 12 cm to 0.75 m. Successful flights after prey were initiated from distances of 30 to 36 cm, although rapid flights of 2 m after prey were commonly observed. Potential prey were sometimes chased over long distances. In some instances the robber fly would veer away when close. Insufficient data are available for establishing any pattern. Foraging by *N. elongatus* occurred as early in the day as 0945 h and as late as 1920 h.

Prey were collected in the air, and, on the single occasion when the author was close enough to observe, the prey was impaled during manipulation following the landing. The same type of manipulation, that of holding the vegetation with one foretarsus and using the other five to revolve the prey, was seen during the feeding sequence on a honey bee. This behavior is similar to that exhibited by *Diogmites angustipennis* Loew in western North America (Lavigne and Holland, 1969). On the single occasion when prey release, following feeding, was observed, the asilid pushed a tachinid off its proboscis with both foretarsi.

Based on 25 measured prey of *N. elongatus*, the "preferred" prey length was 8.3 mm; the prey size varied from 2.8 to 15.0 mm. Measurements of four female and five male asilids suggest that females are slightly smaller than males (17.9 vs. 20.0 mm; range, male: 18.5–21.0 mm, female: 16.3–20.0 mm), an unusual situation. However, males chose smaller prey (18.5–21.0 mm,  $\bar{x}$  7.6 mm) than did females (16.3–20.0 mm,  $\bar{x}$  9.3 mm). Since it is unusual for female asilids to be smaller than males, it is probable that had

a longer series of asilids been collected, the reverse situation would have been found, thus explaining the smaller prey size for males. The number of prey collected from males (9) was slightly more than one-half that collected from females (14). Males showed a slight "preference" for Hymenoptera, whereas females concentrated on both Hymenoptera and Diptera. The species appears to be stenophagic, as defined by Lavigne and Holland (1969), taking as prey representatives of only three insect orders, Diptera (40%), Hymenoptera (48%), and Hemiptera-Heteroptera (12%). Even though there were ca. 15 beehives in the adjoining paddock, honey bees were not being taken excessively in terms of their abundance; only 11% of the prey were honey bees. Despite the fact that bush flies were very conspicuous, these insects were largely ignored by the asilids, presumably because of their small size. The mean predator to prey ratio was 2.3.

Herein is a list of prey taken by *N. elongatus*. Specific identifications were made, where possible, but because of the state of knowledge in some groups, only genus and/or family names are included for some specimens. The number of records and sex of the predator are indicated in parenthesis following the prey record. All prey records are from Sandy Creek, unless otherwise noted.

DIPTERA, Asilidae: *Bathypogon* sp., 12.xii.78 (♀) (Ferries-McDonald Consv. Pk.); Muscidae: *Musca vetustissima* Walker, 7.xii.78 (♂), 8.xii.78 (?); Syrphidae: *Eristalis tenax* L., 1.xii.78 (♀); Tachinidae: *Chaetophthalmus* sp., 7.xii.78 (♀), 8.xii.78 (♂, 3 ♀). HEMIPTERA-HETEROPTERA, Alydidae: *Riptortus* sp., 28.xi.78 (♂); Lygaeidae: *Nysius vinitor* Bergroth, 1.xii.78 (♀); Miridae: *Creonotiades dilutus* Stål, 28.xi.78 (♂). HYMENOPTERA, Apidae: *Apis mellifera* L., 28.xi.78 (2 ♀), 8.xii.78 (♂); Halictidae: *Lasioglossum* sp., 1.xii.78 (♂), 7.xii.78 (♂, ♀); Tiphiidae: Thynninae, 28.xi.78 (♂, ♀), 7.xii.78 (♀), 8.xii.78 (♂, ♀). An additional unidentified Diptera and an unidentified Hymenoptera also served as prey at Ferries-McDonald Conservation Park.

#### MATING

Only one complete mating was observed (28.xi.78). In this instance there was no courtship. A female flying a zigzag pattern through the vegetation at 1240 h was accosted by a male rising out of the understory. Coupling took place at a height of ca. 45 cm and the pair landed on an oat stalk at approximately the same height (temperature 28°C). Upon landing the pair took a tail-to-tail position. The female was feeding on a tiphiid wasp when encountered by the male. She subsequently dropped the prey during a flight to a new resting place. Separation occurred at 1253 h after the female pushed at the genitalic junction with her hindtarsi.

Three other mated pairs were encountered 1101 h (24°C), 7.xii.78; 1223 h (26°C), 7.xii.78 and 1200 h (26.5°C), 8.xii.78. Remaining times in copula were

6 min., 17 min., and 10 min., respectively. Near the end of each mating, the female would alternately raise and lower her hindlegs several times. This action was accompanied by the female pushing against the genitalic connection with her hindtarsi, ca. two minutes prior to separation. At separation the male released his claspers and flew off, leaving the female on site.

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#### LITERATURE CITED

- Hardy, G. H. 1926. A new classification of Australian robber flies belonging to the subfamily Dasypogoninae (Diptera: Asilidae). Proc. Linn. Soc. N.S.W. 51(Pt. 3): 305-312.
- . 1930. Fifth contribution towards a new classification of Australian Asilidae (Diptera). Proc. Linn. Soc. N.S.W. 55(Pt. 3): 249-260.
- . 1934. The Asilidae of Australia. Part II. Ann. Mag. Nat. Hist. (10)14: 1-35.
- Hull, F. M. 1962. Robber flies of the world. The genera of the family Asilidae. Pt. 1. U.S. Natl. Mus. Bull. 224: 1-430.
- Lavigne, R. J. 1982. Ethology of *Neotamus vittipes* (Diptera: Asilidae) in South Australia. Proc. Entomol. Soc. Wash. 84: 617-627.
- Lavigne, R. J. and F. R. Holland. 1969. Comparative behavior of eleven species of Wyoming robber flies (Diptera: Asilidae). Univ. Wyo. Agric. Exp. Stn. Sci. Monogr. No. 18. 61 pp.
- White, A. 1917. The Diptera—Brachycera of Tasmania. Part 3. Families Asilidae, Bombyliidae, Empididae, Dolichopodidae and Phoridae. Pap. R. Soc. Tasmania 1916: 148-266.